

AMENDMENTS TO THE CLAIMS

Claims 1-3 (Cancelled).

4. (Previously presented) An image interpolation system for interpolating gaps between lines forming an image, comprising:

a virtual interpolation data generating means for generating virtual interpolation data of inter-lines between the lines of the input image, based on the input image line data;

an interpolation segment determining means for determining segments, based on the generated virtual interpolation data, to be interpolated between the input image lines and determining the direction of interpolation, for extracting matching patterns; and

an interpolating means which generates pre-interpolation pixels on the input image lines, based on the generated virtual interpolation data and the segment data determined to be interpolated, determined by the interpolation segment determining means, and interpolates pixels between input image lines based on the generated pre-interpolation pixels,

wherein the interpolation segment determining means comprises:
a search condition setup means for setting up a pattern search range; a matching pattern condition setup means for setting up matching pattern conditions; and a first matching pattern searching means for searching for matching patterns based on the conditions

designated by the search condition setup means and by the matching pattern condition setup means.

5. (Previously presented) An image interpolation system for interpolating gaps between lines forming an image, comprising:

a virtual interpolation data generating means for generating virtual interpolation data of inter-lines between the lines of the input image, based on the input image line data;

an interpolation segment determining means for determining segments, based on the generated virtual interpolation data, to be interpolated between the input image lines and determining the direction of interpolation, for extracting matching patterns; and

an interpolating means which generates pre-interpolation pixels on the input image lines, based on the generated virtual interpolation data and the segment data determined to be interpolated, determined by the interpolation segment determining means, and interpolates pixels between input image lines based on the generated pre-interpolation pixels,

wherein the interpolation segment determining means comprises:
a search condition setup means for setting up a pattern search range; a matching pattern condition setup means for setting up matching pattern conditions; a first matching pattern searching means for searching matching patterns based on the conditions designated by the search condition setup means and by the matching

pattern condition setup means; a directional vector extracting means for extracting the direction of the vector of the detected matching patterns; and a second matching pattern searching means for searching for matching patterns existing in the extracted direction of the vector, based on the conditions designated by the search condition setup means and by the matching pattern condition setup means.

Claims 6-8 (Cancelled).

9. (Original) The image interpolation system according to Claim 4, wherein the virtual interpolation data generated by the virtual interpolation data generating means is constructed of units of pixel-rows of data.

10. (Original) The image interpolation system according to Claim 5, wherein the virtual interpolation data generated by the virtual interpolation data generating means is constructed of units of pixel-rows of data.

11. (Previously presented) An image interpolation system for interpolating gaps between lines forming an image, comprising:

a virtual interpolation data generating means for

generating virtual interpolation data of inter-lines between the lines of the input image, based on the input image line data; and

an interpolating means for interpolating the pixels between input image lines, based on the generated virtual interpolation data,

wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; and a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; and a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns.

12. (Previously presented) An image interpolation system for interpolating the gaps between the lines forming an image, comprising:

a virtual interpolation data generating means for generating virtual interpolation data of inter-lines between the lines of the input image, based on the input image line data; and

and an interpolating means which, based on the generated virtual interpolation data, generates pre-interpolation pixels

on the input image lines, and interpolates the pixels between input image lines above and below by performing mutual operations between pre-interpolation pixels generated on the input image lines above and below,

wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines: and a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data: and a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns.

13. (Previously presented) An image interpolation system for interpolating gaps between lines forming an image, comprising:

a virtual interpolation data generating means for generating virtual interpolation data of inter-lines between the lines of the input image, based on the input image line data;

an interpolation segment determining means for determining segments, based on the generated virtual interpolation data, to be interpolated between the input image lines and determining the direction of interpolation, for extracting matching patterns; and

an interpolating means which generates pre-interpolation pixels on the input image lines, based on the generated virtual

interpolation data and the segment data determined to be interpolated, determined by the interpolation segment determining means, and interpolates pixels between input image lines based on the generated pre-interpolation pixels,

wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; and a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; and a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns.

14. (Original) The image interpolation system according to Claim 4, wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; and a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; and a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns.

15. (Original) The image interpolation system according to

Claim 5, wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; and a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; and a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns.

16. (Previously presented) The image interpolation system according to Claims 9 and 10, wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; and a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; and a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns.

17. (Previously presented) An image interpolation system for interpolating gaps between lines forming an image, comprising:

a virtual interpolation data generating means for generating virtual interpolation data of inter-lines between the

lines of the input image, based on the input image line data;
and

an interpolating means for interpolating the pixels between input image lines, based on the generated virtual interpolation data,

wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns; and a coring means for judging the patterns extracted on the same line to be interpolated based on the predetermined threshold and editing them.

18. (Previously presented) An image interpolation system for interpolating gaps between lines forming an image, comprising:

a virtual interpolation data generating means for generating virtual interpolation data of inter-lines between the lines of the input image, based on the input image line data;
and

and an interpolating means which, based on the generated

virtual interpolation data, generates pre-interpolation pixels on the input image lines, and interpolates the pixels between input image lines above and below by performing mutual operations between pre-interpolation pixels generated on the input image lines above and below,

wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns; and a coring means for judging the patterns extracted on the same line to be interpolated based on the predetermined threshold and editing them.

19. (Previously presented) An image interpolation system for interpolating gaps between lines forming an image, comprising:

a virtual interpolation data generating means for generating virtual interpolation data of inter-lines between the lines of the input image, based on the input image line data;

an interpolation segment determining means for determining segments, based on the generated virtual interpolation data, to be interpolated between the input image lines and determining the

direction of interpolation, for extracting matching patterns; and

an interpolating means which generates pre-interpolation pixels on the input image lines, based on the generated virtual interpolation data and the segment data determined to be interpolated, determined by the interpolation segment determining means, and interpolates pixels between input image lines based on the generated pre-interpolation pixels,

wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns; and a coring means for judging the patterns extracted on the same line to be interpolated based on the predetermined threshold and editing them.

20. (Original) The image interpolation system according to Claim 4, wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; a normalizing means for classifying the pixels into multiple classes according to the calculated value of the

difference in pixel data; a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns; and a coring means for judging the patterns extracted on the same line to be interpolated based on the predetermined threshold and editing them.

21. (Original) The image interpolation system according to Claim 5, wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns; and a coring means for judging the patterns extracted on the same line to be interpolated based on the predetermined threshold and editing them.

22. (Original) The image interpolation system according to Claim 16, wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; a normalizing means for classifying the pixels into multiple classes according to the calculated value of the

difference in pixel data; a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns; and a coring means for judging the patterns extracted on the same line to be interpolated based on the predetermined threshold and editing them.

23. (Original) The image interpolation system according to Claim 17, wherein the coring means comprises: an intra-pattern pixel operating means for calculating the average of the pixel differential values of individual pixels in each pattern; and a pattern editing means for judging the average value based on the predetermined threshold and editing patterns.

24. (Original) The image interpolation system according to Claim 18, wherein the coring means comprises: an intra-pattern pixel operating means for calculating the average of the pixel differential values of individual pixels in each pattern; and a pattern editing means for judging the average value based on the predetermined threshold and editing patterns.

25. (Original) The image interpolation system according to Claim 19, wherein the coring means comprises: an intra-pattern pixel operating means for calculating the average of the pixel differential values of individual pixels in each pattern; and a

pattern editing means for judging the average value based on the predetermined threshold and editing patterns.

26. (Original) The image interpolation system according to Claim 20, wherein the coring means comprises: an intra-pattern pixel operating means for calculating the average of the pixel differential values of individual pixels in each pattern; and a pattern editing means for judging the average value based on the predetermined threshold and editing patterns.

27. (Original) The image interpolation system according to Claim 21, wherein the coring means comprises: an intra-pattern pixel operating means for calculating the average of the pixel differential values of individual pixels in each pattern; and a pattern editing means for judging the average value based on the predetermined threshold and editing patterns.

28. (Original) The image interpolation system according to Claim 22, wherein the coring means comprises: an intra-pattern pixel operating means for calculating the average of the pixel differential values of individual pixels in each pattern; and a pattern editing means for judging the average value based on the predetermined threshold and editing patterns.

Claims 29-37 (Cancelled).

38. (New) An image interpolation system for interpolating an image on inter-lines between lines of input image,

wherein a virtual interpolation data including starting position, length and sign for a virtual interpolation line pattern with a pixel row as a unit generated based on sign of difference between the pixel on neighboring image input line data is generated and stored in a database,

a matching judgment is performed on the virtual interpolation data on a continuous line stored in said database and an interpolating segment on said interpolating line is determined based on said judgment result,

pixel row data matching on the input image line is calculated based on interpolating segment determining data and the starting position and the length of the virtual interpolation data used for determining the interpolating segment and a pre-interpolating pixel row is setup on said input image line based on data of said matching pixel row, and

images are interpolated in said interpolating segment on said interpolating line based on said pre-interpolating pixel row.

39. (New) An image interpolation method for interpolating an image on inter-lines between the lines of input image, comprising:

a step of generating and storing in a database a virtual interpolation data including starting position, length and sign for a virtual interpolation line pattern with a pixel row as a unit generated based on sign of difference between the pixel on neighboring image input line data,

a step of performing a matching judgment on the virtual interpolation data on a continuous line stored in said database and determining the interpolating segment on said interpolating line based on said judgment result, and

a step of calculating pixel row data matching on input image line based on interpolating segment determination data and the starting position and length of the virtual interpolation data used for determining the interpolation segment and setting up a pre-interpolating pixel row on said input image line based on data of said matching pixel row.